

Amendments to the Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application:

1. (Canceled)
2. (Canceled)
3. (Previously presented) The method of claim 4, further comprising the step of forwarding the network layer packet based on the contents of the third selected storage location.
4. (Currently amended) In a device for forwarding data packets, the device having a memory containing storage locations, a method comprising:
 - receiving header data of a network layer packet;
 - selecting a first one of the storage locations based on a first set of bits contained in the header data; and
 - executing an instruction stored at the first selected storage location;
 - selecting a second one of the storage locations based on the executed instruction and a second set of bits contained in the header data; and
 - selecting a third one of the storage locations based on contents of the second selected storage location and a third set of bits contained in the header data.

5. (Previously presented) The method of claim 4 wherein the packet is an IP packet.
6. (Canceled)
7. (Previously presented) The method of claim 10 wherein the step of employing the contents of the second entry comprises executing an instruction contained in the second entry to forward the IP packet toward the destination address.
- 8-9. (Canceled)
10. (Currently amended) In a device for forwarding an Internet Protocol (IP) packet toward a destination having a destination address containing a sequence of bits, a method comprising:

 using a first set of bits from the destination address of the IP packet as an index to locate a first entry in a first forwarding lookup that stores a first instruction and a first set of bits;

 ~~where the first entry in the first forwarding lookup provides~~ executing the first instruction to, using the first set of bits, provide direction to a second forwarding lookup, using a second set of bits from the destination address as an index to locate ~~[[a]]~~ the second entry in a second forwarding lookup that stores a second instruction and a second set of bits;

 ~~employing contents of the second entry in forwarding the IP packet, wherein employing contents of the second entry comprises identifying that~~ executing the second instruction to

provide direction, using the second set of bits, to a third forwarding lookup should be used in forwarding the IP packet; and

employing a third set of bits from the destination address as an index to locate a third entry in the third forwarding lookup and employing the contents of the third entry in forwarding the IP packet.

11. (Previously presented) The method of claim 10 wherein the device includes an application specific integrated circuit (ASIC) and wherein the ASIC performs the steps of the method.

12-14. (Canceled)

15. (Currently amended) A device for forwarding received network layer packets wherein the packets include header data, comprising:

a first lookup structure storing entries that further store ~~provide~~ instructions regarding forwarding of network layer packets, said entries being indexed by multiple bits;

a second lookup structure storing entries that further store ~~provide~~ instructions regarding forwarding of network layer packets, said entries being indexed by multiple bits;

a third lookup structure storing entries that further store ~~provide~~ instructions regarding forwarding of network layer packets, said entries being indexed by multiple bits; and

a forwarding controller for using a first set of bits from the header data of each received

packet as an index to locate an entry in the first lookup structure and for executing the instruction stored at the located entry in the first lookup structure, for using a second set of bits from the header data of each received packet as an index to locate an entry in the second lookup structure and for executing the instruction stored at the located entry in the second lookup structure and for using a third set of bits from the header data of each received packet as an index to locate an entry in the third lookup structure and for executing the instruction stored at the located entry in the third lookup structure.

16. (Previously presented) The device of claim 15 wherein the forwarding controller includes a processor for executing instructions and wherein the entries on the first forwarding lookup structure includes instructions to be executed by the processor to provide information regarding how to forward network layer packets.

17. (Original) The device of claim 15 wherein the entries in the first lookup structure are indexed by more than a byte of bits.

18. (Original) The device of claim 17 wherein the entries in the first lookup structure are indexed by two bytes.

19-20. (Canceled)

21. (Previously presented) A switch/router for directing IP packets toward destinations, comprising:

a first lookup array containing entries indexed by leading bits of destination addresses for IP packets, each entry containing an instruction to assist in forwarding an IP packet towards a destination;

a second lookup array containing entries indexed by a successive set of bits that follow the leading bits in the destination addresses for IP packets, each entry containing an instruction to assist in forwarding an IP packet towards a destination;

a third lookup array containing entries indexed by a set of trailing bits that follow the successive set of bits in the destination addresses for IP packets, each entry containing an instruction to assist in forwarding an IP packet; and

a forwarding engine for forwarding IP packets to destinations, where for each IP packet being forwarded, said forwarding engine accesses at least one entry in the lookup arrays indexed by a portion of a destination address for the IP packet being forwarded and executing the instruction contained in the entry that is accessed.

22. (Original) The switch/router of claim 21 further comprising input ports and interface structures that hold information regarding the input ports on which IP packets arrive.

23. (Original) The switch/router of claim 22 wherein the interface structures contain instructions for directing the forwarding engine to access the first lookup array.

24. (Currently amended) In a device for forwarding data packets wherein the device includes a storage having storage locations, a computer-readable medium holding computer-executable instructions for performing a method, comprising:

using a first set of multiple bits from header data for a network layer packet as an index to locate a selected first one of the storage locations that stores a first instruction;[[,]]

executing the first instruction to provide, using a second set of multiple bits from the header data, a location of a second one of the storage locations that stores a second instruction;

executing the second instruction to provide, using a third set of multiple bits from the header data, a location of a third one of the storage locations, ~~in combination with a second set of multiple bits from header data, provides a location of a second one of the storage locations that, wherein the second one of the storage locations provides a location, in conjunction with a third set of multiple bits from the header data of a third one of the storage locations,~~ wherein the third one of the storage locations provides ~~[[an]]~~ a third instruction regarding how the device should forward the network layer packet; and

executing the third instruction to forward the network layer packet toward the destination.

25. (Canceled)

26. (Original) The computer-readable medium of claim 24 where more than a byte from the destination address is used as the index.

27. (Original) The computer-readable medium of claim 24 wherein the network layer packet

contains a header and wherein the method further comprises the step of extracting the information from the header.

28. (Original) The computer-readable medium of claim 24 wherein the packet is an IP packet.

29. (Currently amended) In a device for forwarding an Internet Protocol (IP) packet toward a destination having a destination address composed of a sequence of bits, said device including a first forwarding lookup and a second forwarding lookup, a computer-readable medium holding computer-executable instructions for performing a method, the method comprising the steps of:

using a prefix of multiple bits from the destination address of the IP packet as an index to locate a first entry in the first forwarding lookup that stores a first instruction and a first set of bits;

executing the first instruction to provide ~~where the first entry in the first forwarding lookup provides direction,~~ using the first set of bits, to the second forwarding lookup, using a next sequential set of bits following the prefix in the destination address as an index to locate a second entry in the second forwarding lookup, said second entry having contents, and

employing the contents of the second entry in forwarding the IP packet toward the destination address.

30. (Original) The computer-readable medium of claim 29 wherein the step of employing the

contents of the second entry comprises executing an instruction contained in the second entry to forward the IP packet toward the destination address.

31. (Canceled)

32. (New) The method of claim 4, further comprising:

retrieving, from a lookup element stored in a storage location of the storage locations, multiple bits that select the first set of bits from all of the bits contained in the header data.

33. (New) The method of claim 32, further comprising:

retrieving, from the first one of the storage locations, multiple bits that select the second set of bits from all of the bits contained in the header data.

34. (New) The method of claim 33, further comprising:

retrieving, from the second one of the storage locations, multiple bits that select the third set of bits from all of the bits contained in the header data.